ON THE QUENCHING OF GAMOW-TELLER STRENGTH

J. Rapaport
Ohio University, Athens, Ohio 45701 and Los Alamos National Laboratory, Los Alamos, NM 87545

The (p,n) reaction at intermediate energies has been used to measure differential cross sections in light nuclei, to final states characterized with a $\Delta J^{\pi} = 1^{+}$ transfer (GT states). Experimental ft values for allowed beta-decay transitions in these nuclei are used to normalize the strength of the GT transitions in units of B(GT). This experimental GT strength is compared with predicted shell model strength. For p-shell nuclei the calculated excitation energies of the GT strength using Cohen and Kurath wave-functions are in general agreement with the empirical GT distribution. Up to an excitation energy of about 20 MeV, the total experimental and calculated GT strengths are used to obtain the quenching factor, $Q_F = \Sigma B(GT_{exp}/\Sigma B(GT)_{th})$. It is found that Q_F decreases as the shell gets filled. The lowest value seems to occur for single-hole nuclei. This decrease may be explained by configurations mixing not specifically included in the calculations. The values of Q_F for s-shell nuclei, p-shell nuclei, and some s-d shell nuclei are shown in Fig. 1.

A paper describing the above results will be published in the Canadian Journal of Physics as a contribution to the Workshop on "Isovector Excitation in Nuclei", Vancouver, October 1986.

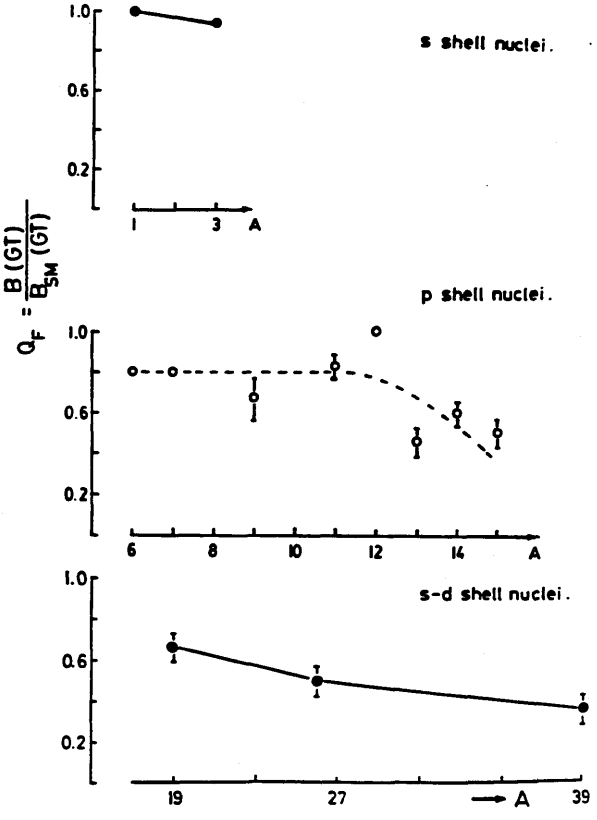

Figure 1. Quenching factor Q_F, for GT transitions in $1 \leq A \leq 39$ nuclei.